



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/162,779	07/03/2001	Johannes Gijsbertus Antonius Terlingen	702-010166	7918

7590 04/10/2003
Russell D Orkin
700 Koppers Building
436 Seventh Avenue
Pittsburgh, PA 15219-1818

EXAMINER

COUNTS, GARY W

ART UNIT	PAPER NUMBER
----------	--------------

1641

14

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/762,779

Applicant(s)

TERLINGEN ET AL.

Examiner

Gary W. Counts

Art Unit

1641

-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25 and 28-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25 and 28-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 1641

DETAILED ACTION

Status of the claims

The amendment filed on February 5, 2003 is acknowledged and has been entered.

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 37 recites a discharge power of up to 5000 W; an exposure duration of up to 1000 s; a plasma gas flow of up to 10000 cm³/min; a pressure of up to 1 bar. However, none of these limitations are disclosed in the specification. The working examples provide only specific numbers that do not correspond with the claimed recitations. See also deficiencies found in claim 38.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 25 and 28-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 the recitation "and defining a stable surface composition layer" is vague and indefinite because it is unclear if this is another layer which is placed on top of the sulfur or if it is a combination of the gold film and the sulfur layer. Further it is unclear what stable is referring to. Does it mean that the surface composition does not

Art Unit: 1641

deteriorate or is very sturdy and does not move or does it refer to something else? See also deficiencies found in claim 33.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claim 25 is rejected under 35 U.S.C. 102(e) as being anticipated by Meade et al (US 5,627,079).

Meade et al disclose a device comprising a substrate comprising a film of gold and a sulfur layer deposited directly on the substrate (col 3 – Col 4).

With respect to “defining a stable surface composition layer” as recited in the instant claim. Because it is unclear if this is another layer which is placed on top of the sulfur or if it is a combination of the gold film and the sulfur layer. Further it is unclear

Art Unit: 1641

what stable is referring to. It is the Examiner's position that the reference reads on the claims as recited.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 25, 28-34, 37-40, 44, 45 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al (EP 0104608) in view of Meade et al (US 6,291,188).

Dunn et al disclose a method and apparatus for modifying the surface chemistry of a substrate. Dunn et al teach that the attachment and orientation of biologically active molecules can be controlled by varying the surface chemistry of a metal substrate surface by using plasma modification techniques which yield a range of surface chemistries and properties (page 4, lines 1-9). Dunn et al teach that these modified polymeric surfaces were subjected to solutions of biologically active molecules and subsequently tested to demonstrate that attachment and orientation of the large molecule is highly dependent on surface chemistry (page 4, lines 10-16). Dunn et al also teach that the surface of the substrate is irreversibly modified by grafting specific chemical functional groups onto the surface with a plasma of suitable material such as sulfur (page 5, lines 1-25). Dunn et al teach that plasmas can be generated by use of DC or AC sources having a frequency of about 1.0W to about 10 kw. Dunn et al also

Art Unit: 1641

teach the use of radio frequency (r.f.) sources to generate plasmas (page 9, lines 14-30). Dunn et al disclose that r.f. plasmas are generated at a frequency of from about 1.0 to about 300 MHz at a power to initiate breakdown, such as from about 5 to about 1000 watts at pressures ranging from 0.001 to 10 Torr. The articles are subjected to the r.f. plasma for a period of about 0.1 seconds to about 120 minutes and the plasma treatment can be followed by a quench cycle at or near the surface with pressures ranging from 1 Torr to 760 Torr for time periods of 1 second to 4 hours (page 10, lines 6-19).

Dunn et al differ from the instant invention in failing to teach the substrate comprising a film of gold and also fails to specifically teach the plasma layer deposited directly on the substrate.

Meade et al disclose metallic solid supports comprised of a substrate comprising a thin layer for film of gold. Meade et al disclose depositing sulfur directly to the metallic surface (col 3, line 10 – col 4, line 67). Meade et al disclose that the use of this metallic gold film provides for covalent attachment of a sulfur (col 3) and the direct deposit of the sulfur provides the advantage minimal blocking and washing steps (col 13).

It would have been obvious to one of ordinary skill in the art to incorporate the use of a gold film and to directly deposit sulfur moieties to the gold film as taught by Meade et al into the method and apparatus of Dunn et al because Meade et al shows that that the use of this metallic gold film provides for covalent attachment of a sulfur and the direct deposit of the sulfur moiety provides the advantage minimal blocking and washing steps.

With respect to the conditions for gas plasma deposition recited in the instant claims, the optimum conditions for discharge power, exposure duration, plasma gas flow, pressure and frequency can be determined by routine experimentation and thus would have been obvious to one of ordinary skill in the art. Further, it has long been settled to be no more than routine experimentation for one of ordinary skill in the art to discover an optimum value of a result effective variable. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum of workable ranges by routine experimentation." Application of *Aller*, 220 F.2d 454,456, 105 USPQ 233, 235-236 (C.C.P.A. 1955). "No invention is involved in discovering optimum ranges of a process by routine experimentation." *Id.* At 458, 105 USPQ at 236-237. The "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." Application of *Boesch*, 617 F.2d 272,276, 205 USPQ 215, 218-219 (C.C.P.A. 1980).

8. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al and Meade et al in view of Kolluri et al (US 5,723,219)

See above for teachings of Dunn et al and Meade et al.

Dunn et al and Meade et al differ from the instant invention in failing to disclose that plasma is deposited from a monomer in gas form.

Kolluri et al teaches the use of a gas monomer in plasma polymerization techniques. Kolluri et al teach that the use of these monomers allow for the determination of a desired surface chemistry (col 5, lines 31-39).

It would have been obvious to one of ordinary skill in the art to incorporate the

Art Unit: 1641

monomer as taught by Kolluri into the method of Dunn et al as modified by Meade et al because Kolluri et al shows that the use of these monomers allow for the determination of a desired surface chemistry.

9. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al and Meade et al in view of Sluka et al (US 5,932,296).

See above for teachings of Dunn et al and Gardella et al.

Dunn et al and Meade et al differ from the instant invention in failing to teach the cleaning of the substrate.

Sluka et al teach the step of cleaning the substrate by means of a pulsed argon plasma before the application of the functional groups to the substrate (col 3, lines 21-24). This process would allow for the removal of any possible surface contamination and allow the surface to be specifically furnished with specific binding sites which are capable of binding directly to an analyte or specific binding partner of interest (col 4, lines 13-15).

It would have been obvious to one of ordinary skill in the art to incorporate the cleaning step as taught by Sluka et al into the method of Dunn et al as modified by Meade et al because Sluka et al shows that this allows the surface to be specifically furnished with specific binding sites which are capable of binding directly to an analyte or specific binding partner of interest.

10. Claims 41-43, 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al and Meade et al in view of Salamon et al (US 5,991,488).

See above for teachings of Dunn et al and Meade et al.

Art Unit: 1641

Dunn et al and Meade et al differ from the instant invention in failing to specifically teach the use of surface plasmon resonance spectroscopy to investigate reactions between interactive bio/chemical species.

Salamon et al teach that a surface plasmon is an oscillation of free electrons that propagates along a conductor surface of a thin film of metal such as gold. Salamon et al teach that surface plasmon resonance occurs under total internal reflection conditions at the boundary between substances of different refractive indices. Salamon et al teach that an incident light beam is reflected internally within the first medium, its electromagnetic field produces an evanescent wave that crosses a short distance beyond the interface with a second medium. If a thin metal film is inserted at the interface between the two media, surface plasmon resonance occurs when the free electron clouds in the metal layer absorb energy from the evanescent wave and cause a measurable drop in the intensity of the reflected light at a particular angle of incidence that depends on the refractive index of the second medium (col 1, lines 39-57). Salamon et al also teaches that surface plasmon resonance is one of the most sensitive techniques to surface and interface effects and is useful for nondestructive studies of surfaces, interfaces, and very thin layers and is also useful as an optical technique for immunoassays (col 1, lines 32-38).

It would have been obvious to one of ordinary skill in the art to incorporate the surface plasmon resonance spectrometry as taught by Salamon et al into the method of Dunn et al as modified by Meade et al because Salamon et al teach that it is one of the most sensitive techniques to surface and interface effects and is useful for

Art Unit: 1641

nondestructive studies of surfaces, interfaces, and very thin layers and is also useful as an optical technique for immunoassays.

Response to Arguments

Applicant's arguments filed February 5, 2003 have been fully considered but they are not persuasive.

Applicant argues that the Dunn et al reference emphasizes an intermediate carbon layer on a metal substrate (such as gold) and thus would be essential. This is not found persuasive because Dunn et al teaches that in the case of metal surface a carbon source is desirable. Dunn et al does not state that it is essential. Further, the teachings of Meade et al show the direct application of sulfur to a metal surface and shows the advantages of the direct application to the surface. Therefore, it is the Examiner's position that the combination of Dunn et al and Meade et al is appropriate and reads on the claims as instantly recited.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary W. Counts whose telephone number is (703) 305-1444. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (703) 305-3399. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-4242 for regular communications and (703)3084242 for After Final communications.

Art Unit: 1641

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Gary W. Counts
Examiner
Art Unit 1641
March 31, 2003



LONG V. LE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600

04/02/03